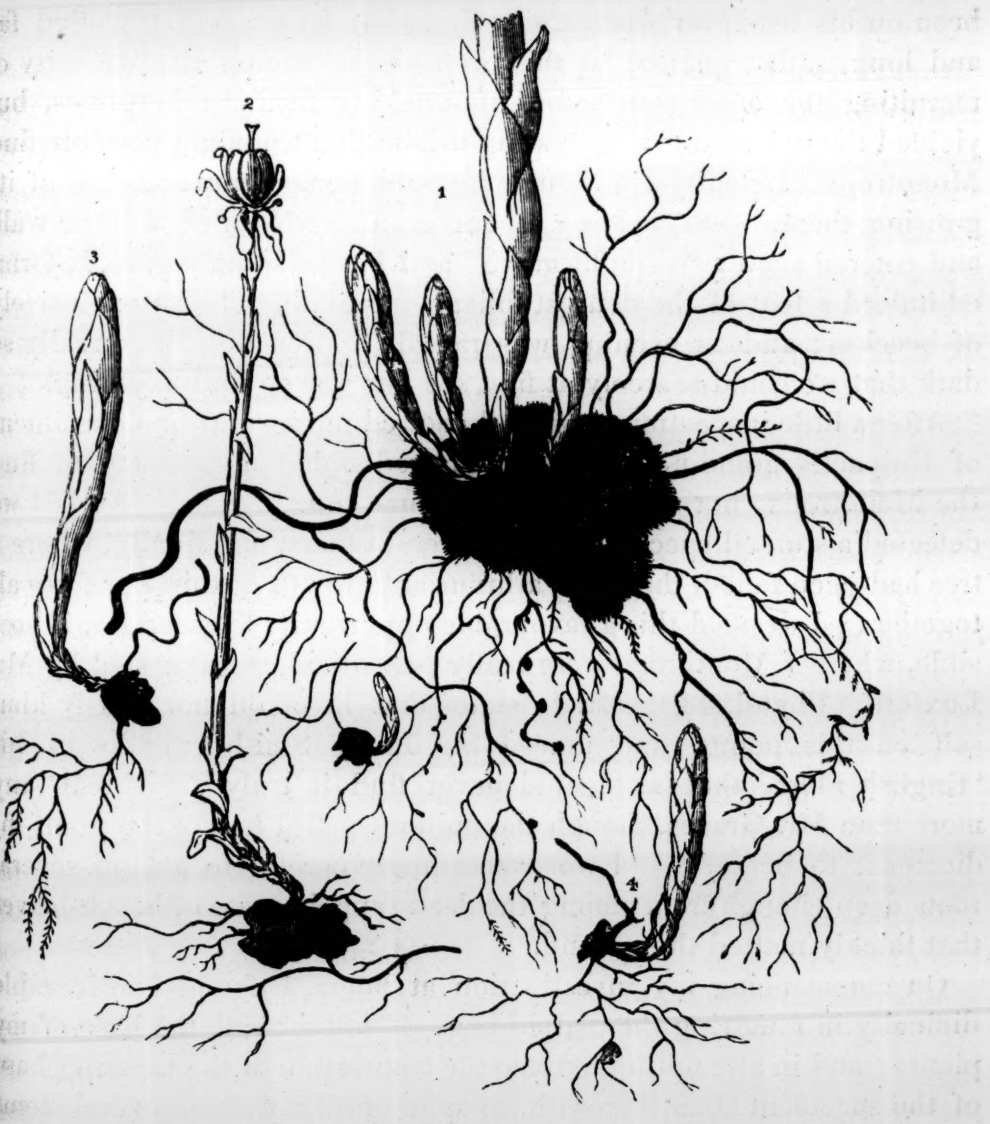
THE PHYTOLOGIST.

No. VII. | DECEMBER, MDCCCXLI. | Price 6d.

Art. XXXV.—*On the parasitic growth of Monotropa Hypopitys.*

By Edwin Lees, Esq., F.L.S., &c.



ILLUSTRATIONS OF THE MODE OF GROWTH OF MONOTROPA HYPOPITYS.

1. Base of a mature plant, 14 inches high, and three young unexpanded plants, growing from their radical parasitical knob. 2. Smaller plant in seed. 3, 4 & 5. Young plants growing from radical knobs.

Having engaged to accompany my friend Mr. Buckman, of Cheltenham, in a botanical exploration of the Cotswold Hills, in the second week of September last, we found ourselves on the evening of the third day at the base of the precipice of Cleeve Cloud, on our return. We had just emerged from a rocky wood, where we had been fortunate enough to find Rubus saxatilis in fine fruit, Convallaria Polygonatum, also in fruit, and some other rarities; and were about at once to turn our steps homeward, when I noticed a thick beech-wood about two miles farther on, and proposed advancing to it. My friend, who had been on his legs ever since the early morn, for we had travelled far and long, rather quailed at this proposition, urging the necessity of recruiting the outer man before undertaking further enterprizes, but yielded the point on my suggesting to him that we might possibly find Monotropa Hypopitys, although he said he had never heard of its growing there. On arriving at our ground we scaled a stone wall, and entered such a "twilight grove" as I have seldom seen. It formed indeed a tent of the densest foliage, consisting almost exclusively of beeches; and as evening was rapidly approaching, was really so dark that we could scarcely at first see our way to find anything.

After a little inspection my friend showed me several fine specimens of Epipactis grandiflora, which only redoubled my anxiety to find the Monotropa, but we searched for some time in vain. At last we detected a stunted specimen, then several others, and finally, where a tree had been felled, there was a luxuriant growth of thirty or forty all together. I deemed this a favourable opportunity to ascertain, if possible, whether Monotropa were really parasitical, as suggested by Mr. Luxford, (Phytol. 43). Mr. L. states that he could not satisfy himself on this point; and indeed Sir James Smith remarks in his 'English Flora,' that he "could never find it truly parasitical, any more than Mr. Graves, though the uniform pallid hue of the plant indicates it to be so."* I was accordingly careful to get up several roots deep enough from among the dead fungoid mass of beech-leaves that thickly matted the ground.

On commencing my investigation at home, I found considerable difficulty in removing the matted mass of soil around the base of my plants; and in attempting to trace the connection of the tapering base of the succulent stem therewith, in spite of all my care, several stems broke off, and I was foiled in my efforts, although I found the fibres of the beech-roots inextricably connected with this compact brown lump, (see fig. 1). Looking carefully, however, over the mass of roots and soil I had brought away, I observed numerous young plants which seemed to promise greater facilities in the examination. These I accordingly worked at very patiently, but still, at the base of each appeared what to the naked eye seemed hard granules of soil mixed up with hairy radical fibres of beech. Expecting that maceration in water would remove this hard matter and expose the roots of the Monotropa, I steeped them in water; but to my surprise they remained as hard and intractable as before. On applying a lens to solve this mystery, it became fully evident that these hard hairy knobs were in fact parasitical nidi attached to the roots of the beech, and deriving their sustenance from them. Having now obtained a clew, I found that the hairy knobs on the beech-roots were of all sizes, from that of a pea, from which the little embryo Monotropa was sprouting, to that of a crab, nourishing a full company of several plants, (see the figures).* These parasitical knobs, which constitute the nidi from which the Monotropa springs, are formed on the extreme radical fibres of the beech, but I was able to trace their connection with the thicker roots, and they were evidently composed of the swollen fibres agglomerated together, and so covered with a brown hirsuture, that to the eye they looked like lumps of compact soil. The larger knobs had the same aspect when examined with a lens, so that they, no doubt, increase in size every year, as additional sustenance is required by the multiplying plants; for when a single plant has once established itself on its parasitical attachment, numerous offsets soon arise from the parent plant, (see fig. 1). At the same time, as the juices are concentrated in the knob, and it increases in size, so do the fibres about it ramify in complexity on all sides, and send forth their spongioles in every direction, so that the parasitic mass, like the mistletoe, always has an abundant magazine at command. These hairy parasitical nidi appear to me most analogous to the moss-balls formed by the Cynips Rosæ on roses and sweet-briars, except that while the latter, being formed for the nourishment and habitation of insects, only endure for a season, the former are perennial.

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* 'English Flora,' ii. 250.

I have shown, I think satisfactorily, that the hairy vesicular knobs that I have discovered, are seated on, and of necessity nourished by, the radical fibres of the beech, connected as these are with the ramifications of larger roots. As the Monotropa springs from and derives its nourishment through the medium of these nidi, which increase in size with the growth of the plant, it is proved to be a true parasite. The figures will show the connection of the knobs and radical fibres perhaps better than can be explained by words.

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* I observed, also, many very minute nodules on the beech-roots, where the embryo plant was as yet not apparent.

I scarcely wonder that any one should consider Monotropa to be non-parasitical, for it requires the utmost care and patience in the examination; and it is only after much attention that I have arrived at the persuasion that it is really a parasite. The full-grown plant is naturally examined by all who have the opportunity, but here the attempt to trace the connection between its stem and the roots of the beech, is rendered so difficult, if not impossible, by the impermeable mass of fibres, mould, and fleshy clusters* that appear, that it becomes no easy matter to untie the truly Gordian knot. Added to which the stem of the Monotropa tapers down to so narrow a junction with its root, that it generally breaks off in the examination. Besides, the whole mass is obscured with a hirsuture that appears like a byssoid fungus. These hairy fibres, however, appear to me to be really part of the economy of the plant, imbibing nutriment from the rootlets of the beech, to which they are closely applied, and conveying it to the succulent radicles of the Monotropa, with which they are also connected. In proof of this I find these hairy fibres closely applied to the swollen rootlets in the smallest plants that I have been able to find. As I before stated, therefore, I perceived it expedient to hunt for young unexpanded plants, their connection with the roots of the beech being more readily observable than in matured flowering ones, from the cause previously mentioned. In every case the only clear way to observe the connection of the roots of the beech with those of the Monotropa, is to steep the hirsute knob at the root of the latter in water, after clearing away as much of the mould as possible, and then placing the moistened mass on paper, carefully examine it with a magnifier. The fleshy roots of the Monotropa will then appear as if covered with a varnish, inextricably mixed up with the beech rootlets, which in various places appear *swollen* at their junction with the parasite, while a close examination shows ultimate hairy fibres fixing the roots of the Monotropa to the rootlets of the beech, and seeming to absorb nutriment from the alburnum of the latter. The rootlets thus circumstanced are evidently in a living state, vigorous, and sending forth their minute spongioles in all directions.

The question still remains for elucidation, as to how the seed of the

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* The fleshy clustered radicles of the Monotropa bear a considerable resemblance to the "densely aggregated fleshy fibres" which form the root of Listera Nidus-Avis. They are as succulent, but still more crowded and brittle than in the latter plant.

Monotropa establishes itself upon the rootlets of the beech, and by what process the hirsute knobs from which it derives its nourishment are formed. The seed must exercise some power in concentrating the juices of the rootlet about it, and in forming this magazine of nutriment, which may be analogous to that performed by the liquid which the Cynips deposits with its egg in the plant or tree frequented by it, producing those curious galls so common on the oak and other vegetables. It may also be questionable how long the Monotropa requires to arrive at maturity after the seed has fallen, for I would not be too certain that the young plants I met with were seedlings of last year, though it is probable they are so. When once established, numerous offsets are thrown off from the perennial nidus. Monotropa Hypopitys varies much in size and luxuriance, some specimens with a single flower being only three inches high, while others occur above a foot in height, with a cluster of seven or eight flowers. The strong primrose-like scent exhaling from it is very remarkable and characteristic.

The seeds are peculiar, and as the valves of the capsule open, they appear pressing out at the interstices like a host of very minute worms. Smith describes them as "very numerous, minute, oval, each enveloped in a membranous reticulated *tunic*, greatly elongated at both ends." In fact their structure is scarcely discernable with the naked eye from their minuteness, but when examined through a lens, they appear like very minute globules of gum, screwed up in a white elongated envelope, and thus simulating the aspect of extremely small worms. They are so adhesive to anything they come in contact with, that even when accidentally dropping on the smooth surface of the finger-nail, they cannot be shaken off. This shows how easily the seeds may affix themselves to the roots of the beech under which they grow, whose radicles, more almost than those of any other tree, approach the surface of the earth, and so occupy the ground that scarcely any other plants, besides mosses and fungi, can flourish beneath its shade.

Malvern Wells, Sept. 28, 1841. EDWIN LEES.

ART. XXXVI. — *Three Days on the Yorkshire Moors.*

By RICHARD SPRUCE, Esq.

THE excursion detailed in the following pages was undertaken, in company with a botanical friend (Mr. Ibbotson of Ganthorpe), principally with the view of exploring Whitston-cliffe, on the western edge of the oolitic hills, and the Hole of Horcum, on the high moors between Pickering and Whitby.

We left Ganthorpe, a small village about a mile and a half West of Castle-Howard, at 9 o'clock in the morning of Tuesday, June 29th, 1841; a walk of a mile brought us to Terrington, a noted locality for Sedum dasyphyllum, which we observed on an old wall. On Colton Moor, three miles farther on, we first observed Digitalis purpurea; and throughout the rest of our journey we never went far without seeing it in greater or less quantity: here too we noticed the pretty Antennaria dioica. From Colton to Gilling the distance is three miles; between the last-named place and Ampleforth College we saw Carex intermedia; and in ascending the steep hill to Ampleforth Mill, we gathered a few plants of Geranium columbinum. On Ampleforth Moor we found Empetrum nigrum and Lycopodium clavatum, plants which occur abundantly on all the high moors, besides a few plants of Aspidium Oreopteris. Having passed Ampleforth Moor we came upon Wass Moor, and were busily employed in hunting for Lycopodium alpinum, which is said to grow there, when we were driven from our ground by a tremendous thunder-storm, and after various stoppages reached the Hambleton Hotel, 16¼ miles from our place of starting, at 5 o'clock P.M., amidst a heavy fall of rain. Our plans were now totally disconcerted, for we had anticipated spending the greater part of the afternoon and evening at Whitstoncliffe; we however started again about 6 o'clock, and in twenty minutes reached the brow of Whitstoncliffe, having in our way observed Listera cordata, Aira verna [?] and Lycopodium Selago. Here the view was most magnificent; we stood on the highest part of an almost perpendicular range of cliffs, extending in the form of a crescent, at an elevation of 1,178 feet above the level of the sea. At our feet lay Gormire, a remarkable lake about a mile in circumference, but appearing to us scarcely larger than a duck-pond; beyond extended a vast plain, a continuation of the vale of York, on which we distinguished Thirsk, distant about five miles, and several other towns; farther still were lofty hills, conspicuous among which was Penhill, at the entrance of the romantic valley of Wensley dale. We now commenced descending the hill—no trifling task, and in our way down gathered fine specimens of Avena pratensis (frequent on the coralline oolite of Yorkshire, and also on the magnesian limestone), Aira cristata, Neckera crispa, Jungermannia Tamarisci and Sphærophoron coralloides. At Gormire we collected Pilularia globulifera, and Potamogeton heterophyllus without floating leaves, and noticed Menyanthes trifoliata. If the descent had been difficult, much more fatiguing and dangerous was it to ascend, as we did at the steepest part where an ascent was at all practicable. On our toilsome journey we collected Arabis hirsuta, Geranium lucidum, Aspidium aculeatum, Cystopteris fragilis, Asplenium Trichomanes, Tortula tortuosa and Jungermannia platyphylla. We had not reached the summit of the cliff when we were again overtaken by a heavy shower, and having clambered up as speedily as possible, we sat down under an old wall with an umbrella spread over us. And here we saw a sight that can be seldom witnessed; a beautiful rainbow extended over our heads to the opposite extremity of the crescent, whence it was continued downwards into the vale below, and, had it not been for the small space immediately underneath us, would have formed a perfect circle. After spending little more than two hours at Whitstoncliffe, for the satisfactory exploration of which as many days would be required, we made the best of our way to the hotel.

We were detained at the hotel by rain until 9 o'clock the following day, June 30th, when we again started and walked across Hambleton to Scawton, 2¼ miles, and in our way gathered Poa compressa and Orthotrichum Hutchinsiæ on an old wall; passing the village we descended into a deep glen called "the Howle," where we spent a considerable time very usefully. The most conspicuous object here was the elegant

Polypodium Phegopteris, which grew in the greatest profusion on the rocks bounding the narrow valley; besides laying in a stock of this, we gathered Dicranum pellucidum, Hookeria lucens, Hypnum palustre, Jungermannia asplenioides, Jung. furcata var. β, *elongata*, Peltidea horizontalis and canina, — *all* beautifully in fructification.

Leaving Scawton Howle we next directed our course to Rievaulx, 3 miles. Nothing particular met our view (save Verbascum Thapsus growing in the rocky places) until we came to a boggy mead within a short distance of Rievaulx, where we gathered fine specimens of Primula farinosa, Schœnus nigricans and Eriophorum pubescens. At Rievaulx, on the bridge which crosses the Rye, grew Geranium pusillum; and at some distance up the river we found a few plants of Hesperis matronalis. We next visited Rievaulx Abbey; I have not room here to expatiate on its beauties, or on those of the romantic valley (Bilsdale) at the southern extremity of which it is situated; but I may mention that we gathered Rosa tomentosa growing nearly at the summit of the ruins of the choir. We were now directed across the hills to Beckdale and Helmsley, but as we had no road to follow, we were many times at a loss which way to turn, and did not reach Helmsley until the evening. But our walk was far from being uninteresting: we passed along several fine and well-wooded valleys, and in one of them, called Dark Gill, we found Helleborus viridis and Actæa spicata growing together in great abundance. This is certainly the wildest station for the former plant I ever saw, and I think no one who should see it growing there, could for a moment doubt its being truly indigenous to the soil: I know several other localities for Actæa, but all on either the coralline oolite or magnesian limestone. Besides the two plants last mentioned, we observed here and there plants of Campanula latifolia, Pyrola minor, Paris quadrifolia and Crepis paludosa. A little beyond this wood we saw on a hill-side a patch of Sambucus Ebulus, but not in flower; and in another wood we found quantities of Elymus europæus and Melica nutans. By the brook-side at the bottom of one of the valleys grew Myrrhis odorata. After toiling up and down hill for a long time, we at last emerged into Beckdale, and commenced searching for Cypripedium Calceolus, which has been gathered there, but did not succeed in finding it. In fact, to examine perfectly the tract of country which we this day only passed through, would require many days, and even weeks. Beckdale extends quite to the town of Helmsley, where we remained a short time for the sake of refreshment and rest, and then started again for Pickering. Our road lay through a highly cultivated, and therefore (to us) uninteresting country; and passing through Kirby Moorside, Symington, &c., we arrived at Pickering about 10 o'clock P.M.

At 8 o'clock next morning we left Pickering by the Whitby railway for the Hole of Horcum. The part of the railway traversed by us runs up a deep valley, through ground in general somewhat marshy, and two or three times crosses the brook which runs through Pickering. As we went along we noticed the following plants: Ægopodium Podagraria, Serratula tinctoria, Myrica Gale, Carex vesicaria and riparia. At Raindale (7 miles from Pickering) we left the railway, and turning to the right, proceeded across the barren moors in the direction of the Hole of Horcum, which we reached after three or four miles of very rough walking, having gathered by the way Sphærophoron coralloides (growing on large stones), and a few plants of Scyphophorus cocciferus. The Hole of Horcum is "a singular basin-shaped hollow, suddenly and deeply excavated, in the Moorlands, through the calcareous grit and lower strata," and may be about four miles in circumference, measured on the ridges of the hills which bound it. Here we expected to meet with Cornus suecica, but we unfortunately happened to come up to "the Hole" at a point exactly opposite to its locality, and being ignorant of this, we sought about in every place that we thought likely to produce the plant, without seeing anything like it, until about noon, when we arrived at a little house standing on the east side, under Saltergate Brow. Here we called and procured some refreshment, and on enquiring if our entertainers had ever observed anything like the plant, which we described to them, we learned that such a plant (called by them " honeysuckle ") had been sometimes come in search of by botanists. The mistress of the house (a widow of the name of Smith) was the only person acquainted with the exact locality, and she chanced to be from home; but her son-in-law recollected having heard her say that it grew on the hill-side adjoining the Whitby road, between two plantations, and to this place he volunteered to conduct us. We gladly accepted his offer, and on coming to the spot were gratified by finding the beautiful little Cornus growing in great plenty, but so nearly out of flower that after a laborious search we only succeeded in procuring a dozen flowers each. Its fruit does certainly considerably resemble that of the common honeysuckle, besides there being a close natural affinity between the two plants, and hence no doubt arose the name we heard given to it. Along with the Cornus were three other plants with nearly ripe fruit, viz., Empetrum nigrum, Vaccinium Myrtillus and Vitis-Idea. The other plants observed here were Habenaria chlorantha, Gymnadenia conopsea, Listera cordata and Crepis paludosa. In our walk hence to Pickering (9 miles) we observed on an old wall near Lockton, Asplenium Trichomanes, Ruta-muraria and Adiantum-nigrum, and a variety of Cystopteris fragilis, growing in great abundance. We also saw here and there, in stony places, Cerastium arvense.

On our return to Ganthorpe (15 miles) next day, our road lay principally through the vale of Pickering (Kimmeridge clay), where we gathered Festuca elatior and Rosa systyla near Kirby Misperton, and Nasturtium sylvestre at Newsham Bridge, where we crossed the Rye. Coming again upon the coralline oolite we found Anthemis arvensis on Barton heights, and this was the last plant we saw worth mentioning. I will only farther observe that although during our ramble we had collected many interesting plants, we were yet deeply sensible that for want of sufficient time we had but imperfectly explored a country which undoubtedly contains many rarities hitherto unnoticed.

RICHARD SPRUCE.

Collegiate School, York,
12th October, 1841.

ART. XXXVII.—*A List of Plants met with in the neighbourhood of Swansea, Glamorganshire.* By J. W. G. GUTCH, Esq.

THE following must by no means be considered a complete Catalogue of the plants to be met with in the unusually rich locality presented by the neighbourhood of Swansea, but rather as the nucleus of a future Swansea Flora. In the absence of such a work, the list is offered to the notice of botanists who may be visiting this portion of Glamorganshire, which they will find a district peculiarly rich in both land and marine plants. Several rarities have been detected there within the last two years, by my friend Mr. Ralfs, of Penzance, a most indefatigable and attentive botanical observer; and I have no doubt that many more, if carefully sought for, might be added to the already copious list, as much ground, I feel convinced, yet remains unexplored.

Swansea can now boast of a Royal Institution for the cultivation and advancement of Science, at the head of which, as President, is L. W. Dillwyn, Esq. The Institution already possesses a most extensive herbarium presented by Mr. Bicheno; and I look forward with confidence to the time when a complete list of all the plants found in the neighbourhood, with a specimen of each species, will be deposited in the Institution: This would indeed be most interesting and acceptable to the botanist visiting Swansea, and would supply, in the best manner, the present want of a local Flora.

Ranunculus Flammula. Neath Canal; Cromlyn Bog; and Singleton Marsh.

——— *Lingua.* On Cromlyn Bog and Neath Canal, in great abundance; also Kenfig Pool.

——— *bulbosus.* Near the Neath Canal by Dan-y-graig.

——— *parvulus.* The plant mentioned under this name in the 'Botanist's Guide' as having been found near St. Helen's, is nothing more than a variety of Ran. hirsutus, (Dillwyn).

——— *hederaceus* and *aquatilis.* Neath Canal.

——— *sceleratus*, *repens* and *acris.*

Trollius europæus. On the banks of the Dylais above the waterfall at Aberdylais, in moist meadows between Pont Nedd Vechn and Usgoed Eynon gaur, and in the valleys about Ystradgunlais, (Dillwyn).

Helleborus fœtidus. Found by Dr. Turton near Park Mill, towards Pennard Castle, and existing at present in great abundance.

Aquilegia vulgaris. In hedge-rows near Mincian Hole, with both white, blue and pink flowers.

Nymphæa alba. In the greatest abundance on Cromlyn Bog, the water at certain seasons of the year being quite studded with its elegant blossoms.

Papaver dubium. Common.

——— *Rhœas.* Kilvey Hill.

Meconopsis Cambrica. At the waterfalls about Pont Nedd Vechn, and in the valley above Aberdylais, plentiful, (Dillwyn).

Glaucium luteum. Near Port Tennant, Singleton and Gower.

Fumaria capreolata. Common by roadsides between Ferry and Port Tennant.

Matthiola sinuata. On the sand-hills between Swansea and the Mumbles, nearly opposite Singleton; and also on the sea side of Cromlyn Burrows, but now much less plentiful than formerly.

Nasturtium officinale. Common.

——— *sylvestre* and *terrestre.* Banks of the Neath Canal.

Barbarea vulgaris. Near Park and Pennard Castle; common at Cadoxton.

Arabis hirsuta. On the walls of Oystermouth Castle; about Park Mill; and near the Ferry.

Sisymbrium thalianum. Near St. Helen's turnpike.

Cardamine hirsuta, Kilvey Hill; and var. *flexuosa*, common.

Draba aizoides. Found growing in the greatest luxuriance on Pennard Castle, where it was first noticed by the late Mr. Lucas, of Stouthall, who communicated his discovery to Dr. Coite of Ipswich; and it was the fault of Dr. Coite, as he admitted to me, that the merit of this interesting addition to the British Flora was not given to Mr. Lucas. Mr. Lucas afterwards showed the plant to Dr. Turton, and he sent the specimens to Mr. Sowerby which were figured in the 'Eng.

lish Botany.' It also grows on the Worms Head, and on several inaccessible cliffs in that neighbourhood; (Dillwyn).

Cochlearia officinalis. **Banks of the Tawe, between Swansea and Llandore, plentiful, (Dillwyn).**

——— *anglica.* **Found by Mr. J. Woods on the river-banks a little above Swansea, (Dillwyn).**

——— *danica.* **Near Singleton; abundant on rocks near Mumbles light-house; in Kidwelly Church, Oystermouth Castle.**

Armoracia rusticana. **Road to Dan-y-graig; in enclosure of Lady Huntingdon's Chapel, Swansea; and Fabian's Bay.**

Thlaspi arvense. **Gathered near Wych-tree Bridge, and I believe it is not uncommon in the neighbourhood, (Dillwyn).**

——— *alpestre.* **About Pont Nedd Vechn and Aberpergwm, (Dillwyn).**

Hutchinsia petræa. **On the walls of Pennard Castle; and on sandy ground south of Pennard Castle, April 20, 1839, by M. Moggridge, Esq.**

Teesdalia nudicaulis. **On wastes and road-sides about Swansea, not uncommon, (Dill.)**

Cakile maritima. **In abundance on the sea-shore near Salt-house point, Fabian's Bay.**

Erysimum Alliaria. **Near the Ferry.**

Senebiera Coronopus. **Singleton Marsh.**

——— *didyma.* **Llandwr Marsh, common; Cadoxton and Fabian's Bay.**

Capsella Bursa-pastoris. **Cline Wood and Mumbles road.**

Lepidium ruderale. **Occasionally found on rubbish-heaps and ballast-banks about Swansea, (Dillwyn).**

——— *campestre.* **On banks of the Neath Canal.**

——— *Smithii.* **Everywhere on the sea-shore.**

——— *Draba.* **Formerly abounded on the ballast-banks by the river-side a few hundred yards northward from the Pottery, but the ground has been converted into wharfs, and I doubt whether it is now to be found there, (Dillwyn).**

Brassica Napus. **Kilvey Hill, common.**

Sinapis Monensis. **On the downs near Park, and above Mincian Hole, two specimens were gathered last summer and one this summer, 1839, (M. Moggridge). Rocks and down near Pennard Castle.**

——— *arvensis.* **Common, near St. Helen's turnpike.**

——— *nigra.* **On a rubbish-heap in a field by the side of the St. Helen's road.**

Diplotaxis tenuifolia. **Near Llandwr.**

——— *muralis.* **Between Swansea and Port Tennant, and common on sand-hills by the road-side.**

Crambe maritima. **On the sandy shore between the Neath and Afan rivers, and found by Dr. Turton, near Porteynon, (Dillwyn).**

Raphanus Raphanistrum. **On Kilvey Hill.**

Viola palustris, **and a white variety. River-side, Pentlegare.**

—— *tricolor.* **Near Singleton, but probably strayed from the garden.**

—— ——— *β, arvensis.* **Common.**

—— *lutea.* **The Black Mountain has been noted as a habitat of this plant since the days of Merrett; and though generally an inhabitant of mountains, I have found it growing on Cromlyn Burrows, (Dillwyn).**

Helianthemum canum. **Cockit, in road leading to back of Uplands.**

——————— *vulgare.* **Common.**

Drosera rotundifolia, longifolia and *anglica*. Town Hill in the boggy ground; also in Cromlyn bog and Cwm bucha.

Polygala vulgaris, and the white and rose-coloured varieties. On the banks of the Neath Canal, Pentlegare, Worms Head.

Malva sylvestris and *moschata*. Common.

—— *rotundifolia*. Near Singleton.

Lavatera arborea. At Paviland Cave and in Loughor Marshes.

Hypericum calycinum. In Nicholston Wood near Penrice Castle; and I believe it to be as much indigenous there as in any other part of Britain; (Dillwyn).

——— *quadrangulum*. Road leading to Kilvey Hill.

——— *perforatum*. Near and on Kilvey Hill.

——— *dubium*. In the woods about Penrice.

——— *humifusum*. Singleton; back of Uplands.

——— *pulchrum*. Near Singleton, and Neath Canal.

——— *elodes*. Near Singleton, and Port Tennant.

——— *Androsæmum*. Singleton, and woods near Neath; Britton Ferry, Drumma and Penrice.

Saponaria officinalis. Plentiful on the Burrows about Singleton, and has been so since 1802, (Dillwyn).

Silene inflata. Sea-shores, common.

—— *maritima*. Rocks on the coast of Gower.

Lychnis Flos-cuculi. Cromlyn Bog and the Neath Canal.

—— *diurna*. Hedges near Kilvey, common.

Spergula arvensis. Kilvey Hill.

Sagina procumbens. Mumbles Road.

Alsine peploides ? Near the Ferry.

Arenaria serpyllifolia. Between the Ferry and Port Tennant.

—— *rubra*. Plentiful in a stone-quarry near Greenhill turnpike.

—— *marina*. Near Neath canal, on muddy shores.

Cerastium glomeratum. Between Swansea and Neath.

——— *triviale*. Common.

——— *tetrandrum*. On sand-hills, not uncommon, growing with C. semidecandrum, of which I am satisfied it is nothing more than a variety, (Dillwyn).

Stellaria nemorum. Discovered by Mr. Woods at Uscoed Hendry, and in other places about the neighbourhood of Ystradgunlais. This plant is common in the north, but I am not aware of its having been found elsewhere in Wales, or in any of the southern or midland counties of England.

—— *media*. Near Singleton.

—— *holostea* and *graminea*. Common.

Linum usitatissimum and *angustifolium*. Common about Swansea, (Dillwyn).

—— *catharticum*. Singleton Marsh; Pennard.

Tilia microphylla. Woods about Pont Nedd Vechn, where it was discovered by Mr. E. Foster. It is figured in 'English Botany,' 1705, with the name of T. parvifolia; (Dillwyn).

Acer Pseudo-platanus. Near Singleton on the marsh.

Geranium pratense. Frequent in the hedge-banks between Aberpergwm and Pont Nedd Vechn.

——— *robertianum* and *columbinum*. Between the Ferry and Port Tennant.

Geranium molle and *dissectum*. Near Port Tennant, (Dillwyn).
——— *sanguineum*. In great luxuriance near Pennard Castle; common on the cliffs in Gower, (Dillwyn).
Erodium cicutarium. Common. A var. *triflorum*, or three-flowered Stork's-bill, is also met with near Swansea. It is plentiful on the sand-hills; and although by many botanists considered to be only a variety of the above, yet it certainly differs materially from it; the peduncles are almost invariably three-flowered.
——— *cicutarium*, vars. *album* and *purpureum*. Sea-shore near the Ferry.
Oxalis Acetosella. Common in hedge-rows.
Montia fontana. On the Town-hill.
Cotyledon Umbilicus. Common, especially on the road to Uplands.
Sedum Telephium. Llandwr Marsh.
——— *acre*. Banks of Neath canal, and Loughor Marshes.
——— *reflexum*. Common on walls.
——— *Forsterianum*. Banks of Neath canal.
Peplis Portula. In Llandwr Marsh.
Lythrum Salicaria. Common in hedges near Singleton.
Rhamnus catharticus. In Cline and other woods, (Dillwyn).
——— *Frangula*. Cline wood.
Ulex europæus and *nanus*. Common.
Genista tinctoria. Llandwr and Forest Marsh; meadows near Pentlegare.
Sarothamnus scoparius. Near Pont Wern; and near Poppit Hill; seen five or six years ago by Mr. Ride.
Anthyllis Vulneraria. In a marsh near Singleton, and on Kilvey Hill.
Ononis arvensis. Near Port Tennant and Singleton.
Trifolium repens. Between Swansea and Singleton.
——— *pratense*. Near Neath.
——— *medium* and *procumbens*. Kilvey Hill.
——— *scabrum* and *glomeratum*. On Swansea and Sketty Burrows, (Dillwyn).
——— *fragiferum*. Near Singleton; banks of Neath canal.
——— *minus*. Cline wood.
Lotus corniculatus and *major*. Common on the sand hills, and near Port Tennant and Singleton.
Medicago sativa. Kilvey Hill, (cultivated ?).
Vicia hirsuta. Fabian's Bay.
——— *Cracca*. Kilvey Hill.
——— *sativa*, *β. angustifolia* and *lathyroides*.
——— *sepium*, var. flore albo. In meadows about Inispenlwch bridge, where this unusual variety was first noticed by Mr. E. Hawkins, (Dillwyn).
Lathyrus sylvestris. About the top of the cliff on the right of the entrance to Caswell Bay, and about Oystermouth Castle.
——— *pratensis*. Common in hedges.
Orobus sylvaticus. Found by J. Llewellyn, Esq. in a woody meadow called Fir-point, Cadley, in the grounds of Pentlegare; found also last summer by the side of the drive to the house.
——— *tuberosus*. Pentlegare and Cline wood.

J. W. G. GUTCH.

(To be continued).

ART. XXXVIII.—*Notices of Books &c. connected with British Botany.*

1. *A Catalogue of British Plants. Part I. Containing the Flowering Plants and Ferns. By* J. H. BALFOUR, M.D. Edin., Regius Professor of Botany, Glasgow; CHARLES C. BABINGTON, M.A. Cantab., F.L.S.; and W. H. CAMPBELL, Secretary to the Botanical Society. *Second Edition. Printed for the Botanical Society of Edinburgh.* Edinburgh: Maclachlan, Stewart and Co. London: H. Bailliere. Glasgow: Smith and Son. Dublin: W. Curry, jun. and Co. Paris: J. B. Bailliere. Leipzig: J. A. G. Weigel. 8vo. 1841.

THE various improvements manifest in the new edition have greatly enhanced the value of this Catalogue, both as a medium of communication and a manual for reference. Not the least of these improvements we consider to be the change of form; for instead of the unwieldy folio sheet, we now have a greater amount of information compressed into a neat octavo. One grand feature of the new edition consists, however, in numerous changes of nomenclature; the names of the editors are a sufficient guarantee that these changes have not been lightly or unadvisedly made, and their reasons for making them will be seen in the following extract from the Preface. "In drawing up the Second Edition of the Botanical Society's Catalogue, the compilers have been desirous, as far as possible, to make the nomenclature of British plants correspond with that adopted by the best continental writers. In doing this, they have been forced to make many alterations, the importance of which will, it is hoped, be recognized by the members of the Society. They have been guided in their amendments chiefly by the works of De Candolle, Koch, Nees von Esenbeck, Kunth and Leighton. When the name of a genus or species has been changed, reference is made to the name under which it appears in the fourth edition of Sir Wm. Hooker's British Flora. The sources whence new species are derived are indicated by reference to the works from which they are taken, and when they are still unpublished as British plants they are marked as additional species."

The importance of following some uniform system of nomenclature cannot be disputed: and anticipating as we do, a very wide circulation for the Botanical Society's Catalogue, we would venture to suggest to our correspondents the expediency of their adopting it as a standard for names in drawing up local lists of plants. We would even go so far as to recommend that the alphabetical arrangement of the Catalogue should also be strictly adhered to; for we consider the systematic arrangement of species in a merely local list, to be a matter of minor importance. The neutrality of the alphabetical arrangement, setting aside its convenience, will surely go far towards recommending the Edinburgh Society's Catalogue as a model worthy of being adopted by botanists engaged in framing local lists of British plants, whether the Linnæan or the natural system may stand highest in their favour as the principle on which a general Flora ought to be arranged.

In comparing the enumerations of the plants in the two editions of the Catalogue, we observe that the new one contains a numerical preponderance over its predecessor, of 13 species and 90 varieties, and includes 24 species not contained in any other list of British plants.

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2. *An Illustrated Catalogue of British Plants, arranged according to the Natural Orders; in which the two Systems are combined by reference to 'English Botany,' the works of Sir. J. E. Smith, Hooker, Lindley, Macreight and DeCandolle. By* C. E. Sowerby, A.L.S. London: Sowerby, 3, Mead Place, Lambeth; Longman & Co.; Simpkin & Co. Part 1, 12mo. November, 1841.

We believe Great Britain to be the only country in the world which can boast of having its botanical treasures fully and ably illustrated by three successive generations of the same family. The merit of designing and engraving the plates of this little work is due to a grandson of the late Mr. Sowerby; and the style in which they are executed is another proof that no inconsiderable portion of the talent displayed in the productions of the first illustrator of 'English Botany,' is inherited by even the younger branches of his family. Each part of the Catalogue will contain 8 plates, each plate comprising 6 coloured figures; the letter-press gives the scientific and English names of the species, their habitats, duration, and times of flowering; together with references to the two editions of 'English Botany,' and to the well-known works of the authors enumerated above. The 48 figures in the first part are very prettily executed. Instead of giving a figure of the *whole* plant on a small and uniform scale, the artist has judiciously adopted the plan of drawing the upper portion of each species, with its flowers and foliage, and, without going minutely into details, has added such other parts as are absolutely necessary for specific distinction. The figures are drawn as nearly of the natural size as the limits would allow, and are carefully and neatly coloured.

We have great pleasure in recommending this Catalogue to the notice of all who, at a moderate price, would possess a portable and useful series of illustrations of our native plants.

3. *A Series of Botanical Labels for the Herbarium, adapted to the respective Floras of Smith, Hooker, Lindley and Macreight.* Edited by a Corresponding Member of the Botanical Society of London. London: Longman & Co.; W. Pamplin, 9, Queen St., Soho Square. Faversham: W. Ratcliffe. 8vo. 1841.

These labels will be found very useful by all engaged in the formation of a British herbarium. They may be had either in sheets, for the purpose of being cut out and attached to the papers containing the species, or made up in a neat 8vo. volume, which can be used as an index to the collection. The following extracts from the preface will more fully explain the plan of the work.

"The aim has been to condense into a small space as much information as possible;—each label therefore contains the Natural Order, the Linnean Class and Order, the generic, specific, and common name of the plant for which it is intended, together with the synonyms of the botanists just named, [Smith, Hooker, Lindley and Macreight]: the principal habitat is also added (except in the case of the rarer plants, where localities are given instead), and a sufficient blank space is left for the insertion of the customary memoranda of time, place, and collector's name.

"As each plant has one or more labels assigned to it whenever the writers abovementioned differ in their nomenclature, all will be able to select that of their favorite text-book, while the synonyms attached will show the arrangement adopted by the other three authorities, and thus, to the less advanced student, tend in some degree to increase the facilities of botanical intercourse."

ART. XXXIX.— *Varieties.*

76. *Note on the Genus Tilia.* There is, I think, a misapprehension on the part of the writer in No. 5 of 'The Phytologist' (p. 79), as to my remarks on the Lime. The fact is, about two years ago I sent to the Botanical Society of London, a paper on the British species of the genus Tilia (lime-tree), which perhaps he heard read. Since that time the Society have published no Transactions, and consequently my paper has not appeared, and I am not aware that any abstract of it was ever printed in the 'Magazine of Natural History,' or elsewhere; except that I also communicated to Mr. Loudon, for his 'Arboretum Britannicum,' the fact of a large wood, of more than five hundred acres in extent, existing in Worcestershire, where, strange to say, the greater part of the *underwood*, regularly cut down at stated intervals, consists of Tilia parvifolia: thus, I should say, removing any doubt, if any could exist, of the indigenousness of this tree, as far as England is concerned. My paper, however, went to show that T. grandifolia was also indigenous, and that T. europæa was to be included under T. grandifolia as a form. Numerous localities were named, and old individual trees adverted to. I also descanted on the natural history of the lime, and contended (at least as far as that tree was concerned) that the *honey-dew* was really an exudation of its saccharine juices, and had nothing to do with the Aphides. I see a very interesting anecdote of Mr. Luxford's is opposed to me as respects another tree (Entomol. No. 90); but the fact really is, that as in the old nursery tale of the shield that was gold on one side and silver on the other, so with the honey-dew. In some cases the Aphides cause it, and in others, *at a particular temperature*, it exudes from the leaves without their agency. The latter is certainly the case with the lime at any rate.—*Edwin Lees; South Cottage, Malvern Wells, October* 4, 1841.

77. *Veronica montana*, (Phytol. 70). This is always included in lists of rare plants, wherefore I cannot tell, unless that it is passed over for Ver. Chamædrys, and consequently esteemed a treasure when accident brings it prominently before the notice of the botanist. It grows plentifully in all the woods and shady dells and dingles in the neighbourhood of Bristol; nor is it less frequent about Manchester, where I have seen it in every locality favourable to its taste for moisture and seclusion. Mere Clough, Agecroft Clough, Boghart-hole Clough, Ouse-end Clough, &c., produce it in abundance.—*L. H. Grindon; Manchester, October* 20, 1841.

78. *Astrantia major.* This plant was, in 1840, discovered by Mr. Dl. Sharpe in the wood above Stokesay Castle, Shropshire, "in plenty." Mr. Borrer this summer examined the wood, which is extensive, and found four large patches of it along the little-frequented path at the upper edge of the wood, and one a little off from the path, near one of the four. It had every appearance of being quite wild, and the locality did not favour the idea of an accidental escape from cultivation. Possibly, however, it may have been sown there; and perhaps some of your correspondents may be able to clear up this doubt, as well as to inform us whether it occurs dispersedly over the wood.—*W. A. Leighton; Shrewsbury, November* 1, 1841.

79. *Silene nutans.* In answer to your correspondent (Phytol. 91), I beg leave to state that to the best of my knowledge Silene nutans grew on Nottingham Castle-rock previously to the castle being burnt, sparingly, as it does at present; but since that event in 1830, it has established itself on the walls, in the crevices between the stones and in fact in every place where it is possible for a plant to vegetate.—*Joseph Sidebotham; Manchester, November* 4, 1841.

Art. XL.—*Proceedings of Societies.*

LINNEAN SOCIETY.

November 2, 1841.—The Lord Bishop of Norwich, President, in the chair. The following donations were announced. Nearly 1000 species of plants collected in Riakhy, Piauhy and Goyaz, by Mr. Gardner. Specimens of Gnaphalium margaritaceum and of a peculiar form of Linaria repens from the west of Ireland, by Mr. Hinckes. A collection of dried plants from the West Indies and Madeira, by Lord Dartmouth. Mr. Ingpen exhibited a myrtle growing in a glass cylinder carefully sealed. A letter from M. Alphonse De-Candolle, announcing the death of his father, was read.

BOTANICAL SOCIETY OF LONDON.

November 5.—Hewett Cottrell Watson, Esq., F.L.S., Vice-President, in the Chair, Donations to the library were announced from the Botanical Society of Edinburgh, the West Riding Geological Society, the Portsmouth Philosophical Society, the Lancaster Natural-History Society, Mr. Thwaites, Mr. Lees and The Rev. I. Sansom. Mr. G. Knapp presented some grasses and mosses from Fernando Po; and British plants were announced as having been received from Mr. Thwaites, Mr. Croall, Mr. Brown, Mr. Fordham, Mr. Simpson, Mr. Lees and Mr. Bidwell. Mr. H. O. Stephens of Bristol presented thirty-three species of British Fungi.

A paper was read from Mr. G. H. K. Thwaites, on *Polystichum aculeatum* and *Pol. lobatum*. The author observes that owing to the difference of opinion entertained respecting these ferns by botanists of celebrity — some considering them two distinct species, and others that they are merely varieties of one — any facts tending to bring to light their real character must be interesting; and therefore he has much gratification in making known a peculiarity of structure exhibited by each, whereby he considers all doubt as to their being distinct species will be removed.

The two ferns, in their typical form, differ very materially from each other; and their differences have been well described by those who have written on the subject. But almost all, if not the whole of the characters which have been set down as distinctive, are liable to be so extremely modified by different degrees of altitude, moisture, light, exposure &c. of situation, that an unpractised eye would often be quite unable to determine the species of these closely-allied plants, whence, questionless, has arisen the doubt as to their separate specific individuality. Thus, Polystichum lobatum, upon an elevated situation, possesses a lanceolate frond, generally very close and compact; its pinnæ overlapping each other; occasionally, however, these are distant from each other to almost the extent of their width, and the pinnulæ are more separated, so that the plant much resembles P. aculeatum. But P. lobatum, when growing in a low situation, is still more like P. aculeatum; its fronds, instead of being lanceolate, inclining more to ovate, its pinnulæ also are not merely serrated, but become slightly pinnatifid, indeed the plant can with difficulty be identified. These facts, and several others which might be adduced, show the slight value, in this genus, of characters derived from the outline of the frond or of the pinnæ and pinnulæ, which are all so liable to vary in this particular: it was therefore very desirable to endeavour to find some more constant character by which these kindred species, if they proved species, might be distinguished one from the other; and after many hours spent in diligent examination of a great number of fronds, the author discovered a difference of venation in the two species, which he thus describes.

"In examining the fronds of P. aculeatum, it may be noticed that the veins which bear thecæ are not continued, like the rest of the veins, to the edge of the pinnulæ, but each terminates either at its mass of thecæ, or at a very little distance beyond it. The same thing is not observable in P. lobatum (when *mature*), for the corresponding veins in this are each continued through its mass of thecæ to the very edge of the pinnule, and even in the fronds of immature plants of this species, when there is but little fructification, the same character is perceptible in the pinnulæ nearest the base of the pinnæ and of the frond — the parts which in ferns exhibit most strikingly all the characters of maturity: in a few of the terminal pinnulæ some of these veins do not reach the edge. It must not be concealed that in P. aculeatum, in an extremely few instances (being just what might be expected) is a slight indication discoverable of a theciferous vein being continued to the edge of the pinnule; but in this the appearance is very different to the decided character observable in P. lobatum."—*G. E. D.*